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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,833	06/08/2005	Mikio Sakaguchi	1422-0678PUS1	8685

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EXAMINER
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KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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09/23/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,833	<b>Applicant(s)</b> SAKAGUCHI ET AL.	
	<b>Examiner</b> Kevin P. Kerns	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 13-16, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 13-16, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 1 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/17/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed July 17, 2008 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

In this instance, the applicants have not provided copies of non-patent literature documents CA, CB, and CC. Also, on page 2 of the IDS letter of July 17, 2008, the applicants state (under III., box d. OTHER) that a "Notice of Opposition dated April 17, 2008 through European Patent Office is enclosed hereto". However, this document is also absent from the IDS, nor is it even listed under its "Non Patent Literature Documents" section.

### ***Specification***

2. The disclosure is objected to because of the following informalities: on page 5, 7<sup>th</sup> line, replace "resistant" with "resistance". On page 21, 19<sup>th</sup> line, it is unclear what is meant by "JIS K 6721". Appropriate correction is required.

### ***Claim Objections***

3. Claims 1 and 13 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

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Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In this instance, independent claim 6 recites “weight ratio of 0.9 to 17”, whereas claims 1 and 13 recite “weight ratio of 1 to 15”, which is inconsistent because these are specific values rather than ranges. It is suggested to revise the claim language such that all of claims 1, 6, and 13 recite the same weight ratio.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 1, 6, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US 6,054,073) in view of JP 5-169184.

Kobayashi et al. disclose a method for producing inorganic spherical sand particles, in which the method includes supplying raw material (powder) through a burner to pass through a flame (fusing in flame), in which the particles of the raw material include silica, alumina, or a double oxide such as or mullite (abstract; and column 2, lines 44-50), such that the raw material ranges in size from 0.5 to 200 microns (column 2, lines 53-54), thus forming spherical particles upon conducting the fusing in flame (abstract; column 1, lines 45-58; column 2, lines 26-28 and 44-59; column 3, lines 34-41; column 6, lines 42-67; column 7, lines 1-40; and Examples). Kobayashi et al. do not specifically disclose that the alumina/silica weight ratio of the spherical sand particles is 0.9 to 17, as well as its use as a casting mold.

However, JP 5-169184 discloses high siliceous spherical molding sand and its production and use as a casting mold, in which <20 wt% alumina and >80 wt% silica (<1 to 4 alumina/silica weight ratio) results, such that this spherical molding sand composition is advantageous for providing excellent molding strength (as a casting mold) during a casting process, as well as dimensional accuracy and removal of the sand after casting (abstract).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the method for producing inorganic spherical sand particles through a fusing in flame process, as disclosed by Kobayashi et al., by using an alumina to silica weight ratio of <1 to 4, as taught by JP 5-169184, in order to

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provide excellent molding strength (as a casting mold) during a casting process, as well as to obtain dimensional accuracy and removal of the sand after casting (JP 5-169184; abstract).

Regarding the applicants' weight ratios of alumina to silica, one of ordinary skill in the art would have recognized that the ratios of spherical molding sand components are subject to routine experimentation and process optimization, in order to obtain desired chemical and mechanical properties of the molding sand. As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

7. Claims 2-5, 7, 8, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US 6,054,073) in view of JP 5-169184, and further in view of Anzai et al. (US 4,923,520).

Kobayashi et al. (in view of JP 5-169184) disclose and/or suggest the features of claims 1, 6, 18, and 19. Neither Kobayashi et al. nor JP 5-169184 specifically discloses the spherical degree being at least 0.95 (or 0.98), as well as the low water absorbency.

However, Anzai et al. (col. 2, lines 66+) teach the use of a fusion in flame process for the purpose of promoting fused silica particles having spherical degree of more than 0.99 (or 99 volume percent), of which are in nearly perfect spherical form

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(Anzai et al.; col. 4, lines 20+), and a very low water absorption of about 0.21 wt%, which is much lower than 0.8 wt% as claimed (see Anzai et al.; Table 3).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the method for producing inorganic spherical sand particles through a fusing in flame process, as disclosed by Kobayashi et al., by using an alumina to silica weight ratio of <1 to 4, as taught by JP 5-169184, in order to provide excellent molding strength (as a casting mold) during a casting process, as well as to obtain dimensional accuracy and removal of the sand after casting, and by further using a high spherical degree and low water absorbency, as taught by Anzai et al., in order to improve flowability and de-gassing (Anzai et al.; col. 1, lines 38+) and to promote mechanical strength (Anzai et al.; col. 2, lines 64+). Regarding claim 16, the use of 50% by volume of spherical molding sand in the mixture of molding sand would have been obvious to one having ordinary skill in the art, in order to provide the mixed molding sand with improved flowability and de-gassing (Anzai et al.; col. 1, lines 38+) and to promote mechanical strength (Anzai et al.; col. 2, lines 64+).

### ***Response to Amendment***

8. The declaration under 37 CFR 1.132 filed July 18, 2008 is sufficient to overcome the rejection of claims 1-10 and 13-21 of the prior Office Action based upon JP 8-90150 and the combination of JP 8-90150 with US 4,923,520.

***Response to Arguments***

9. The examiner acknowledges the applicants' amendment provided with the request for continued examination received by the USPTO on July 18, 2008. In addition, the Information Disclosure Statement (IDS) of July 17, 2008 has been considered and initialed (with the exceptions of the items discussed in above section 1), and a copy of the IDS is provided with this Office Action. New specification and claim objections are raised in above sections 2 and 3. The applicants have cancelled claims 9, 10, 17, 20, and 21. Claims 1-8, 13-16, 18, and 19 are currently under consideration in the application.

10. Applicants' arguments with respect to claims 1-8, 13-16, 18, and 19 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571)272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin P. Kerns  
Primary Examiner  
Art Unit 1793

/Kevin P. Kerns/  
Primary Examiner, Art Unit 1793  
September 10, 2008